

CLAIMS

1. A refrigeration system comprising:
  - (A) a storage unit comprising at least one hollow structure bordering an enclosed space, said hollow structure containing liquid coolant;
  - (B) a cryocooler having a cold head comprising a cold heat exchanger, an aftercooler and a regenerator; and
  - (C) means for passing refrigeration from the cold head to the liquid coolant.
2. The refrigeration system of claim 1 wherein the means for passing refrigeration from the cold head to the liquid coolant comprises means for passing liquid coolant from the storage unit to the cryocooler and means for passing liquid coolant from the cryocooler to the storage unit.
3. The refrigeration system of claim 1 wherein the liquid coolant is a multicomponent refrigerant fluid.
4. The refrigeration system of claim 1 wherein the cryocooler is a pulse tube refrigerator comprising a pressure wave generator, and a pulse tube containing working gas for receiving a pressure wave from the pressure wave generator.
5. A refrigeration system comprising:
  - (A) a storage unit having a storage space;

(B) a purge gas generator, a cryocooler having a cold head, means for passing gas from the purge gas generator to the cold head of the cryocooler, and means for passing fluid from the cold head of the cryocooler into the storage space; and

(C) a gas contaminant cleaning system, and means for passing gas from within the storage space to the gas contaminant cleaning system.

6. The refrigeration system of claim 5 wherein the means for passing gas from the purge gas generator to the cold head of the cryocooler includes the gas contaminant cleaning system.

7. The refrigeration system of claim 5 wherein the gas contaminant cleaning system comprises an ejector.

8. The refrigeration system of claim 5 wherein the purge gas generator comprises an air compressor and an air cleaning system.

9. The refrigeration system of claim 5 wherein the purge gas generator comprises a membrane nitrogen generator.

10. The refrigeration system of claim 5 further comprising a heat exchanger wherein the means for passing gas from the purge gas generator to the cold head of the cryocooler includes the heat exchanger, and the means for passing gas from within the storage space

to the gas contaminant cleaning system includes the heat exchanger.

11. The refrigeration system of claim 5 wherein the cryocooler is a pulse tube refrigerator comprising a pressure wave generator, and a pulse tube containing working gas for receiving a pressure wave from the pressure wave generator.